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ABSTRACT OF THE DISCLOSURE

A cobalt film, which is a metal film, is deposited on a gate electrode, a heavily-doped source/drain region, etc., which is a semiconductor layer. Then, first thermal annealing is performed to cause a silicification reaction so as to form a polycrystalline cobalt silicide film. Then, ions such as arsenic ions or silicon ions are implanted into the cobalt silicide film so as to change the cobalt silicide film into an amorphous cobalt silicide film. Alternatively, nitrogen is introduced into the silicide film. After second thermal annealing, there is obtained a polycrystalline cobalt silicide film with substantially no agglomeration of crystal grains. Nitrogen may be introduced, before the formation of the cobalt silicide film, into a portion of the semiconductor layer that is to be silicified.

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